U.S. Army Research, Development and Engineering Command

Human Systems Community of Interest (HS COI)

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

DoD HFE TAG, Plenary

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Direction of COI Purpose/Role

Driven by Reliance 21*

Move from solely a coordinating body to one that:

- **Drives S&T portfolio management**
- **Develops meaningful cross-Component Capabilities Roadmaps**
- **Makes decisions about funding of specific programs**
- **Better understands and documents the "successes" produced by the DoD S&T enterprise**

* See http://www.acq.osd.mil/chieftechnologist/reliance21.html

Evolution of Reliance 21

1) Restructure the DoD's S&T technical portfolio management to enhance coordination, coherence, integration, and burden sharing

- *Develop a stable framework of COIs in cross-cutting areas, effective across the whole S&T portfolio*

2) Employ the COI framework to build and implement strategic S&T roadmaps for the Department

- *Concrete and measurable goals, clearly linked to military capability*
- *COIs are empowered to identify gaps and issues, and make recommendations to the S&T ExCom for resolution*
- *COIs should identify opportunities to leverage external investment and expertise*

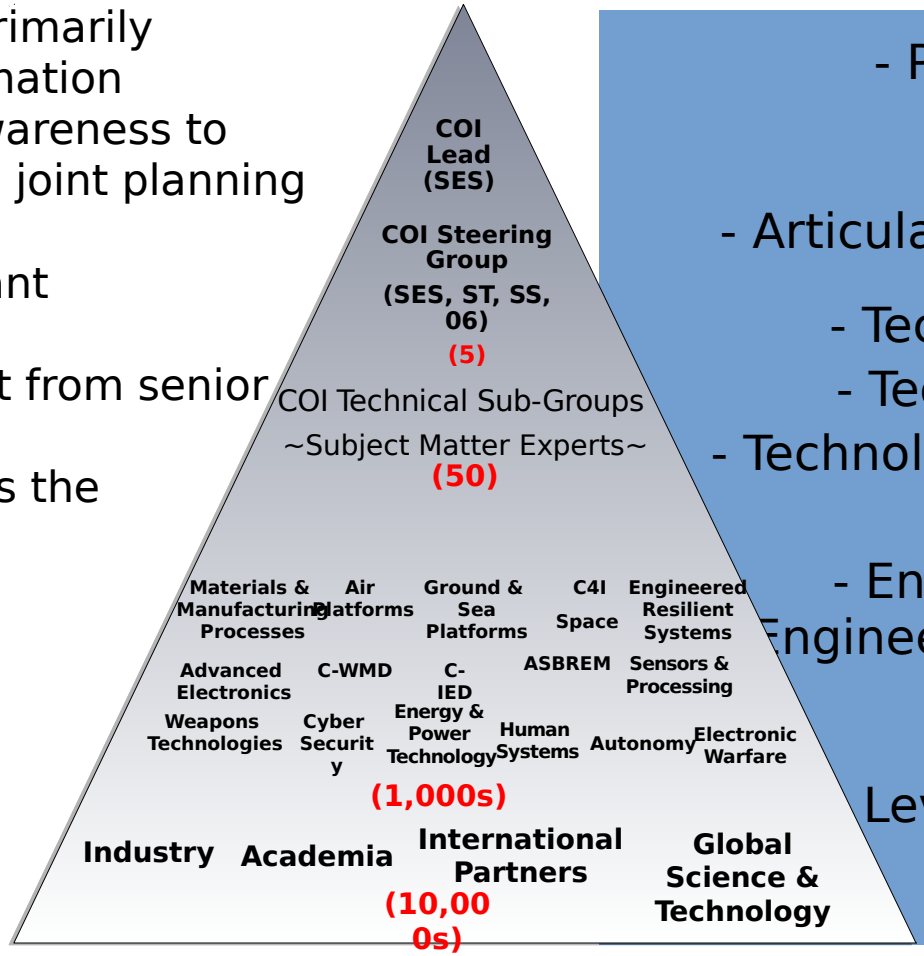
3) The S&T ExCom provides leadership to optimize investment and impact across the S&T portfolio

- *Act to mitigate or accept risks, deliver opportunities, or utilize burden sharing (reliance), as recommended by COIs*

COI Construct

Goal is to make the COIs the "go-to" source for DoD S&T expertise, leadership and coordination

- Transition from primarily focused on information exchange and awareness to collaboration and joint planning
- Requires significant commitment of time and effort from senior individuals across the Components

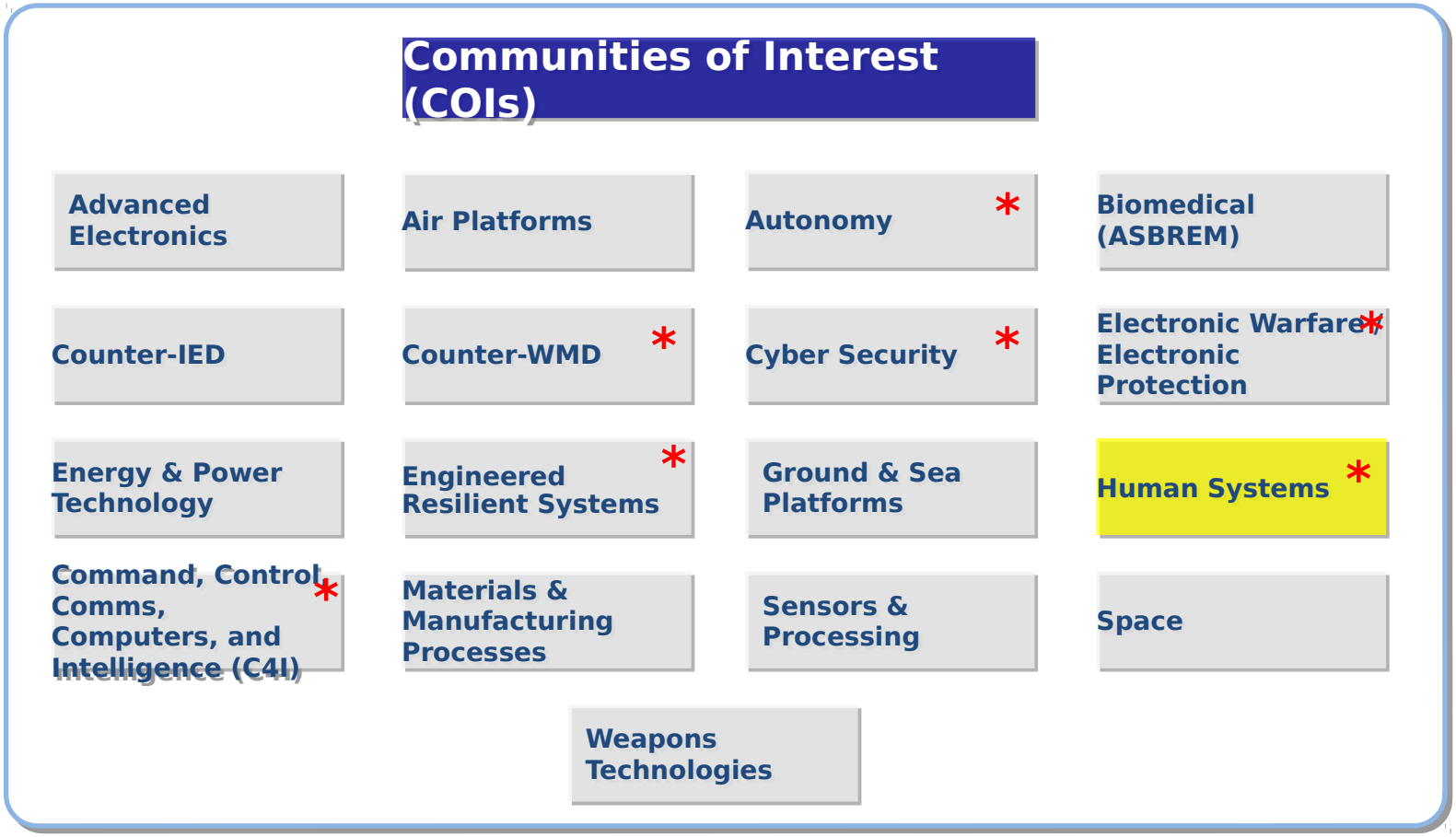


- Prioritizing Gaps and Opportunities
- Articulating Military Impact
- Technical Coordination
- Technology Roadmaps
- Technology Goals and Gaps
- Engaging Scientists & Engineers across DoD Labs

Leveraging global S&T Community

Stable Framework of COIs

- **S&T ExCom has established 17 COIs**

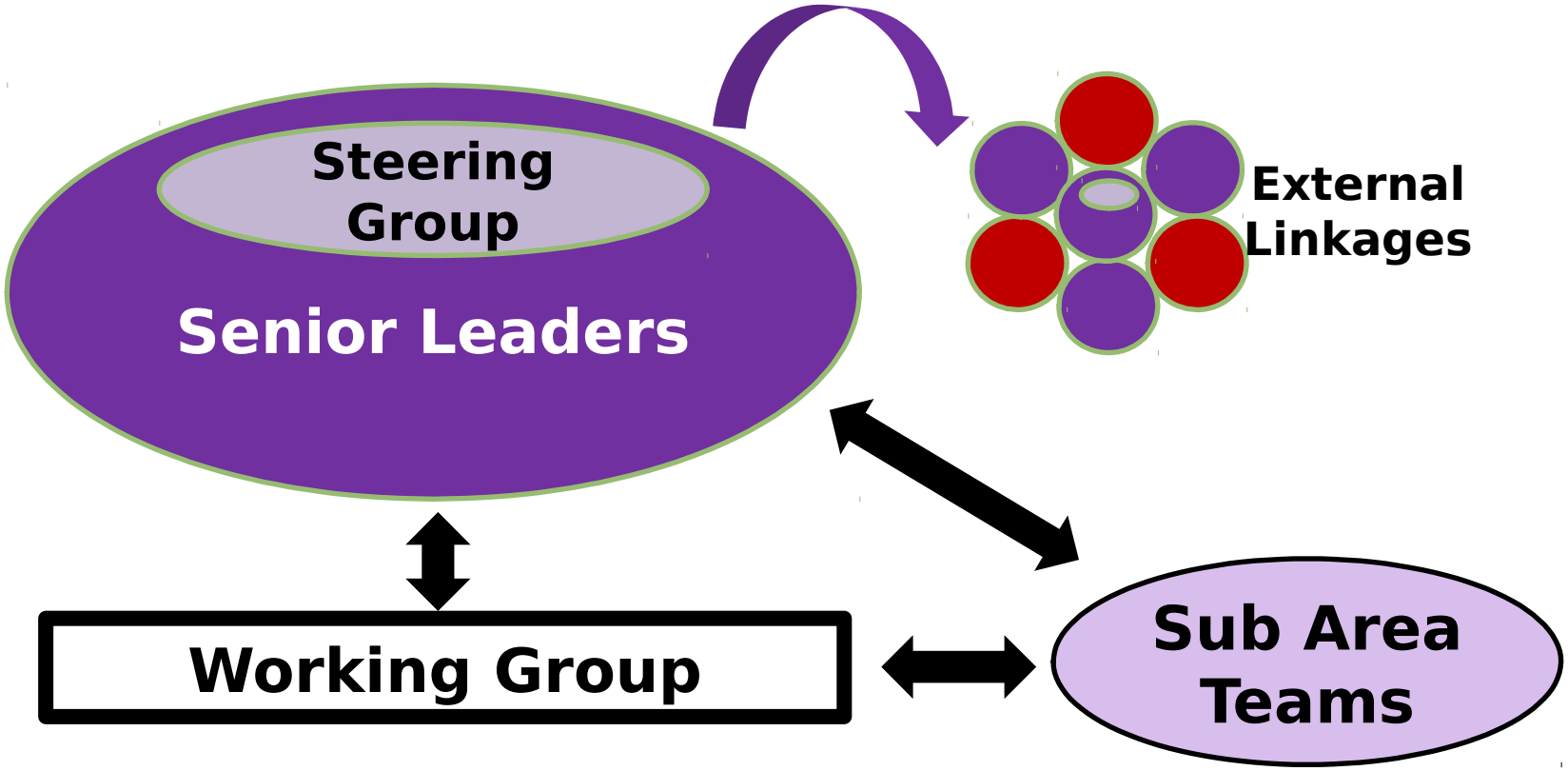


* *Note: The appropriate COI Steering Group has responsibility for the DoD cross-cutting S&T Priorities*

Human Systems
Community of Interest

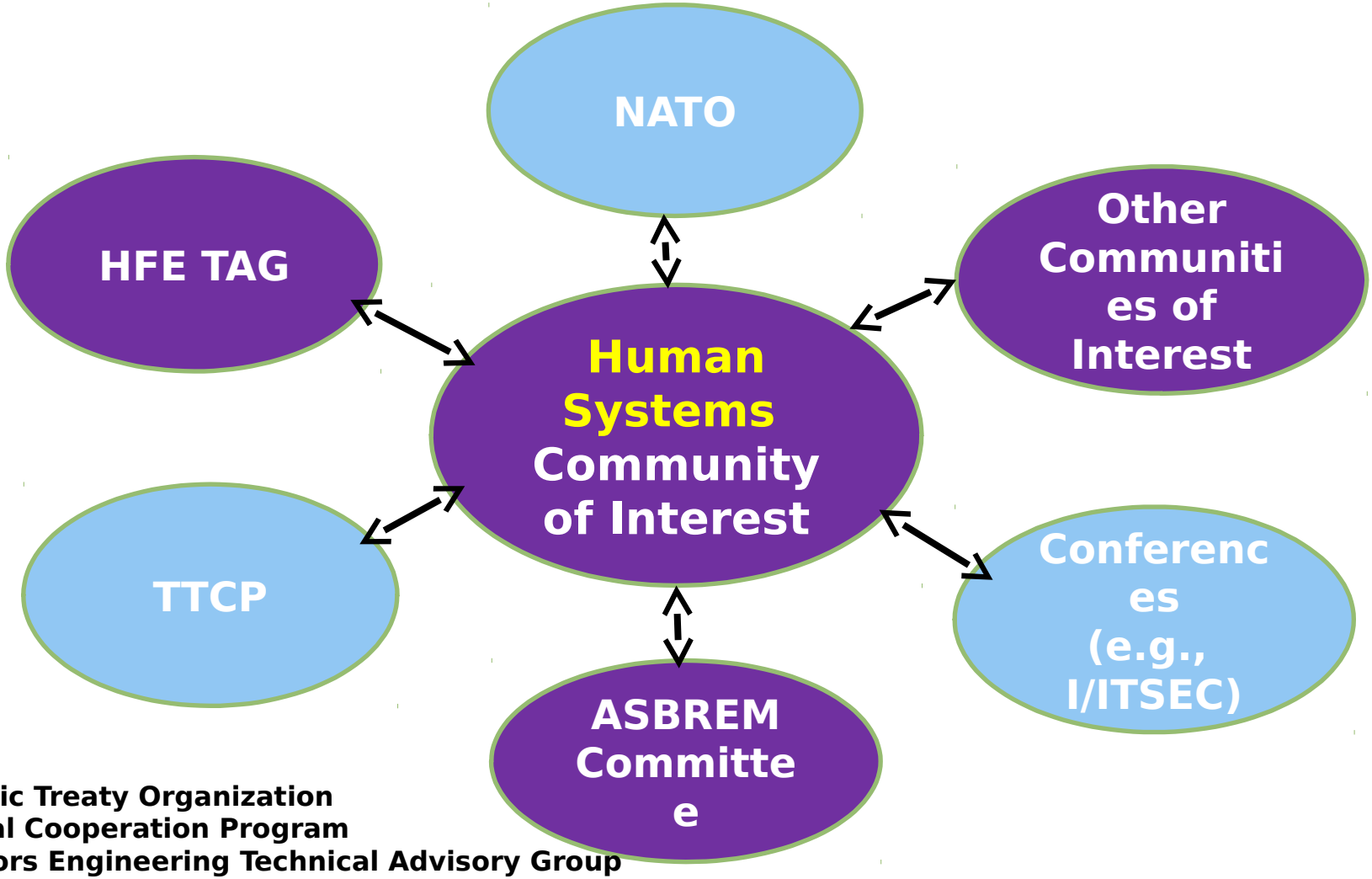
- **OSD goal: Make COIs the "go-to" source for DoD S&T expertise, leadership and coordination -- deliver maximum impact for the DoD's Science & Technology (S&T) dollars**
  - **Transition from primary focus on information exchange/awareness to collaboration and joint planning**
- **COI: Provide framework for DoD Components DoD Executives, Scientists, Engineers, & Human Systems Integration experts to:**
  - **Share information, ideas, and best practices**
  - **Identify opportunities to leverage external investment & expertise**
  - **Identify gaps and issues; make recommendations to DoD S&T execs**
  - **Report on state of the health of the Human Systems Defense Technology Area and related S&T**

Human Systems COI
Organizational Structure



- ***Multiple service/agency participation***
- ***Breadth across disciplines***
- ***Links to other Communities of Interest***

Human Systems COI
External Linkages



th Atlantic Treaty Organization
Technical Cooperation Program
han Factors Engineering Technical Advisory Group
ed Services Biomedical Research Evaluation and Management
rservice/Industry Training, Simulation and Education Conference

Human Systems COI
Primary Organizations

- **Army Research Laboratory – Human Research & Engineering Directorate**
- **Army Research Institute for the Behavioral and Social Sciences**
- **Army - Natick Soldier Research, Development, and Engineering System Center**
- **Office of Naval Research – Warfighter Performance Department**
- **Air Force Research Laboratory – 711 Human Performance Wing**
- **ASD(R&E) – Human Performance, Training, & BioSystems**

Human Systems COI
Participating Organizations

- Army – MANPRINT Office
- US Army Medical Research & Materiel Command
- Navy – Human System Integration Engineering
- Navy – Naval Air Systems Command
- Navy Medical Support Command
- Air Force Human System Integration Office
- Air Force Medical Service
- ASD(HA) – Force Protection & Readiness
- NATO Human Factors & Medicine Panel
- DoD Human Factors Engineering Technology Advisor Group
- Defense Threat Reduction Agency – Chemical/Biological Technologies

Human Systems
Operational Capability Scope

JWSTP - Joint Warfighting S&T Plan

Human Systems COI

Personnel & Training:

Right Person, Right Job, Right Skills

- Selection/assignment measures
- Training methods

System Interfaces:

Effective, Natural Human-Machine Teaming

- Human-machine interfaces
- Human cognitive processing models
- Natural interfaces with systems

Social/Cultural Understanding:

Our Forces Prepared for Global Challenges

- Socio-cultural data collection, models and tools
- Social network analysis

Protection & Sustainment:

Ensuring the Safety & Survivability of our Warfighters

- Physical aiding & performance enhancement
- Combat related logistics & equipment

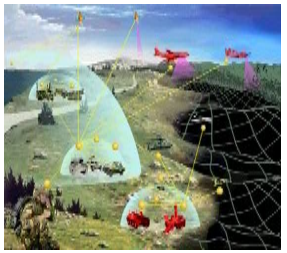
Human Systems
Science & Technology Scope

System Interfaces

- Human-Machine Interfaces
- Human cognitive process modeling
- Decision-making models
- Human state modeling
- Applied Neuroscience
- Trust
- Metrics & measures of effectiveness

Personnel & Training

- Force management & modeling
- Selection & Classification
- Theory of learning
- Adaptive, tailored instruction
- Live, virtual, constructive sims
- Realistic immersive training
- Training methods, tech, & media
- Education & training strategies
- Innovative leader development
- Metrics & measures of effectiveness



Social & Cultural Understanding

- Cultural situation awareness
- Socio-cultural models & synthetic entities
- Socio-cultural data in denied areas
- Social network analysis
- Building partnerships
- Metrics & measures of effectiveness

Protection & Sustainment

- Extreme environment protection
- Combat clothing & protective equipment
- Extended combat rations & field feeding equipment
- Physical aiding
- Performance enhancement
- Vehicle escape & crash safety
- Survival & rescue
- Aerial delivery
- Warrior-System integration
- Metrics & measures of effectiveness

FY13 Accomplishments/FY14 Plans

FY13 Accomplishments

- **Participated in technical conferences & workshops**
  - ☑ **I/ITSEC (December 2012)**
  - ☑ **IR&D Technical Interchange (Summer 2013)**
- **Operationalized initial Human Systems Marketplace**
  http://www.defenseinnovationmarketplace.mil/humansystems.html

FY14 Plans

- **Participate in technical conferences & workshops**
  - o **I/ITSEC (December 2013)**
  - ☑ **NDIA Conference (Feb 2014)**
  - ☑ **Human Factors TAG (May 2014)**
- **Brief HS COI portfolio to ASD (R&E) staff (May/Nov 2014)**
- **Continue IR&D discussions with Industry**

COI Roadmapping

- **The S&T ExCom has asked for ‘Level 3’ output from 8 COIs**
  - Cyber, EW, C4I *(focus on C2)*, Human Systems *(focus on Training)*, Autonomy, ERS, Energy & Power Technologies, Sensors & Processing
- **These are areas where the S&T Leadership particularly want to build roadmaps**
  - It does not reflect priority, but recognizes that the S&T communities and leadership do not have the bandwidth to produce and review detailed roadmaps for all 17 COIs
  - The ExCom will re-assess its needs and expectations at some future point
- **All other COIs will still be expected to brief Portfolio Reviews every year**
- **Portfolio Review is a catalyst for COI activity and a chance to highlight issues to leadership, but POM builds are not dependent on these out-briefs**
  - COI activity should inform POM build and other decisions throughout the year

Building COI Roadmaps

- **What are technology opportunities / goals / objectives?**
  - Need specific technical goals linked to quantified objectives
- **What is military impact of meeting those technical targets?**
  - Technical targets linked to required or achievable mission or capability impact
  - Technical achievements that will enable new missions or capability
  - Or technology push / opportunity, looking to achieve some breakthrough / game changing level of performance (and why is this important)
  - What is the timing of military requirements, insertion opportunities or threat development?
- **What technical plans are in place, and where are the gaps?**
  - What can't we do technically (gaps) and what do you need to get to (technical parameters), and what capability / operational difference does it make?
  - When does it need to happen to make a difference?
  - What are recommended approaches to close gaps / deliver opportunities?
- **Who are key DoD S&T performers? Where are DoD centers of excellence?**
- **What are the opportunities to leverage external investment / expertise?**
  - Where are USG, US industry and Global S&T centers of excellence?
  - How DoD roadmaps compare to the civil / industry / international roadmaps?
- **What are the transition opportunities?**

S&T ExCom – International S&T Engagement

- **ASD(R&E) International S&T Engagement Strategy was presented for discussion on 20 Nov 13**
  - The Strategy document has been circulated for comment to S&T offices and IPOs
- **ASD(R&E) committed to leading on developing an assessment of the 'Global S&T Landscape'**
- **AT&L IC committed to reinvigorating efforts on a cross-Component International S&T engagement database**
- ***It was agreed that COIs should develop a common picture of international S&T engagement in their field (short-term)***
- ***It was agreed that COIs should be informed of new agreements, for situational awareness – not for approval (medium-term)***
- ***It was agreed that COIs should consider international efforts as part of their roadmap development (longer-term)***
- **Process will be piloted for US/UK engagement for Cyber, Data, Energy, and Space**

Backup

COI Steering Group Nominees & Members

COIs	Steering Group Nominees (Air Force, Army, Navy and ASD(R&E))		Steering Group Members (Other)
Advanced Electronics	**Dr. Mike Deis (Air Force)***	**Dr. Gerald Borsuk (Navy)***	Dr. Robert Colwell (DARPA)
	Dr. Philip Perconti (Army)*	**Mr. Ted Glum (ASD(R&E))***	
Air Platforms	**Mr. C. Douglas Ebersole (Air Force)***	**Dr. Tom Beutner (Navy)***	
	Dr. Bill Lewis (Army)*	**Dr. Spiro Lekoudis (ASD(R&E))***	
Biomedical (ASBREM)	**Brig Gen Timothy Jex (Air Force)***	**Dr. Patrick Mason (ASD(R&E))***	Mr. Ellison Urban (DARPA)
	MG Joseph Caravalho (Army)*		MG Jay Santee (DTRA)
	Dr. Frazier Glenn (Army)		RDML Michael Anderson (HQMC)
	Dr. Terry Allard (Navy)*		MG Nadja West (J4)
	RADM Bruce Doll (Navy)		MG Lucas Polakowski (J8)
	Mr. Ashley Johnson (Navy)	Dr. Frederick Pearce (ASD(R&E)	COL Harlan Walker (USSOCOM)
			Dr. Richard Levine (USUHS)
			Dr. Terry Rauch (OASD-HA FHP&R)
			COL Robert von Tersch (MEDCOM)
Autonomy	**Dr. Morley Stone (Air Force)***	**Dr. Patrick Mason (ASD(R&E))***	
	Dr. John Bornstein (Army)*	**Mr. Rob Gold (ASD(R&E))***	Ms. Gill Pratt (DARPA)
	Mr. Chuck Shoemaker (Army)	CDR Joseph Cohn (ASD(R&E))	Dr. Steve Dowling (DTRA)
	Dr. Bobby Junker (Navy)*	Dr. Dai Hyun Kim (ASD(R&E))	
	Dr. Mark Steinberg (Navy)		
Command & Control, Computers, Communications and Intelligence	**Dr. George Duchak (Air Force)***	**Mr. Rob Gold (ASD(R&E))***	
	Mr. John Willison (Army)*	Mr. David Jakubek (ASD(R&E))	Dr. Larry Stotts (DARPA)
	Ms. Barbara Broome (Army)	Dr. Dai Hyun Kim (ASD(R&E))	Mr. Richard Buchter (MDA)
	Dr. Carey Schwartz (Navy)*	Dr. Michael May (ASD(R&E))	Mr. Bob Morgan (MDA)
	Dr. Stephen Russell (Navy)	Dr. Syed Shah (ASD(R&E))	
Counter-IED	**Dr. Mikel Miller (Air Force)***	**Dr. Karl Dahlhauser (ASD(R&E))***	Mr. Eric Houser (DHS)
	Dr. Mike Grove (Army)*	Mr. Chris O'Donnell (ASD(R&E))	Dr. Donald Cronce (DTRA)
	Mr. Matt Donohue (Army)	**Mr. Lee Mastroianni (Navy)***	Mr. Lou Wasserzug (CTTSO)
	Dr. Bert Davis (Army)	Ms. Debra Boline (Navy)	Lt Col Gregory Cyrus (JS)
	Dr. Mark Radar (Army)	Mr. Keith Plumadore (Navy)	LtCol John Heye (USMC)
			Mr. Randy Scholl (NGIC)
Counter-WMD	**Dr. David Hardy (Air Force)***	**Dr. Patrick Mason (ASD(R&E))***	Dr. Steven Wax (DTRA)
	Dr. Augustus W. Fountain III (Army)*	Dr. Bindu Nair (ASD(R&E))	Dr. Ben Petro (NSC/CB)
	Dr. Joseph L. Corriveau (Army)	Mr. Benjamin Riley (ASD(R&E))	Mr. Evan Hoapili STRATCOM/J8)
		Dr. Lewis Sloter (ASD(R&E))	Mr. Charles Wolf (DARPA)
			COL Jon Woods (DIA)
Cyber Security	**Dr. Richard Linderman (Air Force)***	Mr. Jim Wylie(Army)	Mr. Gregg Ackley (DTRA)
	Mr. Henry Muller (Army)*	**Dr. Wen Masters (Navy)***	Mr. Grant Wagner (NSA)
	Mr. Alex Kott (Army)	Mr. Gary Toth (Navy)	Dr. Boyd Livingston (NSA)
	Dr. Cary Butler (Army)	**Dr. Steven King (ASD(R&E))***	

* Principal Member

COI Steering Group Nominees & Members (Cont.)

COIs	Steering Group Nominees (Air Force, Army, Navy and ASD(R&E))		Steering Group Members (Other)
Electronic Warfare	**Mr. David Hime (Air Force)***	**Dr. Peter Craig (Navy)***	
	Dr. Leslie Litten (Army)*	**Mr. Jay Kistler (ASD(R&E))***	
Energy and Power Technology	**Mr. John Nairus (Air Force)***	**Dr. Richard Carlin (Navy)***	
	Dr. Ed Shaffer (Army)*	Dr. Mark Spector (Navy)	
	Mr. John Willison (Army)	**Mr. Jack Taylor (ASD(R&E))***	
Engineered Resilient Systems	**Mr. Tom Fischer (Air Force)***	**Dr. John Pazik (Navy)***	
	Dr. Jeffery Holland (Army)*	Dr. Scott Harper (Navy)	
	Dr. Niki Goerger (Army)	Dr. Ron Joslin (Navy)	
	Dr. Simon Goerger (Army)	**Mr. Michael May (ASD(R&E))***	
	Dr. Mark Valco (Army)	Mr. Scott Lucero (ASD(R&E))	
		Ms Philomena Zimmerman (ASD(R&E))	
Ground and Sea Platforms	**Ms. Jennifer Hitchcock (Army)***	Dr. David Horner (Army)	
	Dr. Patrick Baker (Army)	**Dr. John Pazik (Navy)***	
	Mr. David Lyon (Army)	Mr. Ashley Johnson (Navy)	
	Mr. Al Schumacher (Army)	**Mr. Jack Taylor (ASD(R&E))***	
	Mr. Jeff Jaster (Army)		
Materials and Manufacturing Processes	**Dr. Barry Farmer (Air Force)***		
	Dr. Jeff Zabinski (Army)*	**Dr. Julie Christodoulou (Navy)***	Mr. Michael Maher (DARPA)
	Dr. Don Carlucci (Army)	**Dr. Lewis Sloter (ASD(R&E))***	Dr. Viktoria Greanya (DTRA)
	Mr. Ben Kerstiens (Army)		
Sensors and Processing	**Dr. Michael Eismann (Air Force)***		
	Dr. Don Reago (Army)*	Mr. Doug Burdette (Army)	Ms. Gill Pratt (DARPA)
	Dr. James Campbell (Army)	**Dr. Michael Pollock (Navy)***	Mr. Michael Scherr (DTRA)
	Dr. Philip Perconti (Army)	**Dr. John Stubstad (ASD(R&E))***	Dr. Meimei Tidrow (MDA)
Space	**Dr. Greg Spanjers (Air Force)***	**Dr. Jill Dahlburg (Navy)***	
	Mr. Thomas Webber (Army)*	**Dr. John Stubstad (ASD(R&E))***	
Weapons Technologies	**Dr. John Wilcox (Air Force)***	Mr. Rick DeFatta (Army)	Mr. Stephen Waller (DARPA)
	Mr. Mike Zoltoski (Army)*	**CAPT David Woodbury (Navy)***	Dr. Steve Dowling (DTRA)
	Ms. Barbara Machak (Army)	Dr. David Drumheller (Navy)	Mr. Richard Matlock (MDA)
	Mr. Steve Cornelius (Army)	**Dr. Spiro Lekoudis (ASD(R&E))***	Mr. Peter Zurzenhauser (ODNI)

*(P) - Principal Member, (Co-P) – Co-Principal Member